

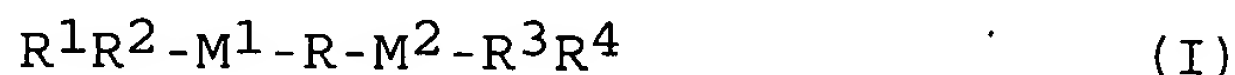
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PROCESS FOR THE CARBONYLATION OF PENTENENITRILE

Abstract of the Disclosure

Processes to prepare 5-cyanovaleric acid or its
5 ester is provided, by carbonylation of a
pentenenitrile, wherein pentenenitrile is reacted
with carbon monoxide and water and/or an alcohol in
the presence of a catalyst system. The catalyst
system contains:

- 10 (a) a metal of Group VIII or a compound thereof and
(b) a bidentate phosphine, arsine and/or stibine
ligand, wherein the bidentate ligand has the
general formula (I):



- 15 wherein M^1 and M^2 are independently P, As or Sb,
R is a divalent organic bridging group, which
bridging group comprises a chain of 3 to 5 atoms
directly connecting the 2 phosphorus atoms, which
chain consists of carbon atoms and optionally a
20 nitrogen, oxygen or sulphur atom or a silano or
dialkylsilicon group, which alkyl groups
independently comprise from 1 to 4 carbon atoms,
and R^1-R^4 represent the same or different
optionally substituted tertiary alkyl groups,
25 (c) an acid having a pK_a less than 3, as measured at
18 °C in an aqueous solution.

ϵ -caprolactam is also prepared by reduction of 5-
cyanovaleric acid or ester obtained above to 6-

aminocaproic acid or ester, and then cyclisation of the 6-aminocaproic acid or ester to ϵ -caprolactam.

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